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ABSTRACT

The primary objective of this study was to determine the most effective of three spelling programs for sixth graders coming from two culturally different and racially distinct areas of a large metropolitan school district. A secondary objective was to examine any differences which might exist between inner-city and suburban children in the attainment of spelling skills. A third purpose was to measure the growth in spelling achievement from pretest to posttest for all subjects. Three spelling strategies were used as treatments: (1) teacher constructed strategy; (2) Kottmeyer strategy, involving a series of eight grade level workbooks which sequentially present the phonetic and structural characteristics of words; and, (3) Hanna strategy, which assumes that the phoneme-Grapheme correspondence can produce reliable spelling generalizations. Two hundred and sixteen graders served as subjects. Half of the subjects came from an inner city elementary school with an ethnic composition of 88 percent Negro and 12 percent Korean and Japanese. The other 108 subjects came from a suburban elementary school which draws from a middle to upper-middle class Jewish and Caucasian community. A pretest-posttest design was employed. There were 36 subjects in each group. There was an equal number of boys and girls in each group. (Author/JM)

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# THE EFFECTS OF THREE SPELLING PROGRAMS ON THE SPELLING ACHIEVEMENT OF SIXTH GRADERS FROM TWO CULTURALLY DIFFERENT AREAS*

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The primary objective of this study was to determine the most effective of three spelling programs for sixth graders coming from two culturally different and racially distinct areas of a large metropolitan school district. A secondary objective was to examine any differences which might exist between inner-city and suburban children in the attainment of spelling skills. A third purpose was to measure the growth in spelling achievement from pretest to posttest for all subjects.

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## Nature of the Spelling Strategies Used as Treatments

1. Teacher Constructed Strategy: This strategy employs no systematic basis. The individual teacher constructs the weekly spelling list based upon the assumed needs of the children. The teacher selects words from content areas such as social science or science and/or from high frequency spelling usage lists. The words may be introduced in context and are used as needed.

2. Kottmeyer Strategy: This spelling strategy is based on the philosophy that spelling power is possible only when pupils have learned to look discriminatingly at symbols. The Kottmeyer program involves a series of eight grade level workbooks which sequentially presents the phonetic and structural characteristics of words. An attempt is made to present general-

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izations of alphabetic principles in sequential order. Transfer of alphabetic principles is developed by the formation of generalizations about the lists of study words. The main weakness of this method is that the final weekly spelling list is also presented. Thus, it cannot be readily determined whether the pupil has internalized and applied the alphabetic principles and generalizations. The pupil may have learned the weekly spelling words merely by rote memorization.

3. Hanna Strategy: The Hanna Strategy is also based upon the philosophy that spelling power is possible only when pupils have learned to look discriminatingly at words. There are also eight grade levels of study in the Hanna program. The thrust of the Hanna Strategy is that analysis of the phoneme-grapheme correspondence can produce reliable spelling generalizations. At level six the Hanna strategy is markedly different from the Kottmeyer strategy in that the ability of the pupil to make generalizations based on alphabetic principles can be determined since the final weekly spelling lists are not included. Alphabetic principles are studied and then evaluated at the end of a weekly unit by asking the pupil to transfer his knowledge of the alphabetic principles to words which have not been deliberately presented during the week. However, the words that appear on the final weekly spelling list do correspond to the alphabetic principles which have been studied during that week. Consequently, the element of rote memorization of word lists has been reduced.

## Research Hypotheses

The present study was designed to test and analyze the following null hypotheses:

Hypothesis 1

There will be no significant difference in the combined pretest and posttest mean scores for both schools among the three different spelling programs.

Hypothesis 2

There will be no significant difference in the combined pretest and posttest mean scores for all three spelling programs between the inner-city and suburban sixth graders.

Hypothesis 3

There will be no significant difference in both schools for all three spelling programs between the pretest and posttest mean scores.

## Sample

Two hundred sixteen sixth graders served as subjects. Half of the subjects came from an inner city elementary school with an ethnic composition of 88% Negro and 12% Korean and Japanese. The other one hundred eight subjects came from a suburban elementary school which draws from a middle to upper-middle class Jewish and Caucasian community. Both schools are in the very large Los Angeles Unified School District. Geographically, the two schools are approximately thirty miles apart.

## Design and Procedures

A Pretest-Posttest Design was employed. Within each school the subjects were organized into three groups. There were thirty-six subjects in each group. There was an equal ratio of boys and girls within each of the six groups.

One group from each school received spelling instruction solely via the Hanna Linguistic Spelling Program. One group from each school received

spelling instruction only via the Kottmeyer Spelling Program. One group from each school received spelling instruction exclusively via the teacher constructed spelling program. At both schools teachers were selected who believed that the particular spelling program they were using was the most effective one. The organization of the treatments in the design are shown in Illustration I.

Illustration I

Pretest - Posttest Design

| Weeks 1-32 | | | |
|---|---|---|---|
| $O_1$ | $X_1$ | $O_2$ | (Inner-city, Hanna) |
| $O_1$ | $X_2$ | $O_2$ | (Inner-city, Kottmeyer) |
| $O_1$ | $X_3$ | $O_2$ | (Inner-city, Teacher) |
| $O_1$ | $X_4$ | $O_2$ | (Suburban, Hanna) |
| $O_1$ | $X_5$ | $O_2$ | (Suburban, Kottmeyer) |
| $O_1$ | $X_6$ | $O_2$ | (Suburban, Teacher) |

Where: O indicates a spelling test was administered.
$X_1$ indicates inner-city subjects were instructed via the Hanna Spelling Strategy
$X_2$ indicates inner-city subjects were instructed via the Kottmeyer Spelling Strategy
$X_3$ indicates inner-city subjects were instructed via the Teacher Constructed Spelling Strategy
$X_4$ indicates suburban subjects were instructed via the Hanna Spelling Strategy
$X_5$ indicates suburban subjects were instructed via the Kottmeyer Spelling Strategy
$X_6$ indicates suburban subjects were instructed via the Teacher Constructed Spelling Strategy

Instrument

The subjects were pretested on the Spelling subtest of the California Test of Basic Skills (Form W, Level II) in September, 1971. In May, 1972, the subjects were posttested on the Spelling subtest of the California Test of Basic Skills (Form W, Level II) with the words given in a different order than on the pretest. The Spelling subtest is composed of 50 words drawn from frequency lists as well as words based upon a sequential development of the alphabetic principle. The 50 words were presented orally to the subjects, a sentence was given using the word in context and a final pronunciation of the word was given. The subject was asked to write the word after the second pronunciation. The same words were used on the posttest as well as the same procedure. However, the order or sequence of the words was randomly chosen for both the pretest and posttest to reduce patterning, response set and memorization effects.

Statistical Analysis

A two-way analysis of variance was used to test the three-null hypotheses stated in the present study. The .05 level of significance was utilized. The Scheffé post-hoc multiple comparison method was applied to test the difference between all of the obtained means when the F ratio was found significant for a given hypothesis.

Although t tests are not considered appropriate following analysis of variance, they were performed for the purpose of gaining a more thorough and detailed understanding of the data. The results are shown in the appendices.

ANALYSIS OF VARIANCE SUMMARY TABLE COMPARING THE COMBINED PRETEST AND POSTTEST MEAN SCORES FOR BOTH SCHOOLS AMONG THE THREE SPELLING PROGRAMS.

TABLE 1

| Source | Means | df | Mean Square | F |
|---|---|---|---|---|
| Hanna Spelling Program | 28.56 | | | |
| Kottmeyer Spelling Program | 25.54 | 2 | 908.41 | 8.46* |
| Teacher Constructed Spelling Program | 24.65 | | | |

*P <.01

There was a significant difference among the mean scores for the three spelling programs. Therefore, Hypothesis No. 1 was rejected. The results derived from the analysis of variance showed that there were significant differences in the effectiveness of the three spelling programs on the spelling achievement of sixth graders from two culturally different areas. The Scheffé method was applied to test the significance of the differences between all pairs of means. The results are reported in Table A.

TABLE A

THE SCHEPPÉ POST-HOC MULTIPLE COMPARISON SUMMARY TABLE
FOR THE THREE SPELLING PROGRAMS

| Means | | | Difference Between Means | Confidence Limits | |
|---|---|---|---|---|---|
| | | | | Lower | Upper |
| Set I (Hanna) | Set II (Kottmeyer) | Set III (Teacher) | | | |
| 28.56 | 25.54 | | 3.02 ± (2.07) | .95 | 5.09 |
| 28.56 | | 24.65 | 3.91 ± (2.07) | 1.84 | 5.98 |
| | 25.54 | 24.65 | .89 ± (2.07) | -2.18 | 2.96 |

The results of the Scheffé post-hoc multiple comparison method indicated that the difference between the means of Sets I and II and between Sets I and III were significant at the .05 level. The difference between the means of Sets II and III was not significant at the .05 level.

These findings indicate that sixth grade students who received spelling instruction via the Hanna Linguistic Spelling Program outperformed the sixth grade students who received spelling instruction via the Kottmeyer Strategy or the teacher constructed spelling strategy. Students using the Kottmeyer Strategy did not outperform students who received spelling instruction via the teacher constructed program.

ANALYSIS OF VARIANCE SUMMARY TABLE
COMPARING INNER-CITY AND SUBURBAN SPELLING MEAN SCORES FOR
THREE SPELLING PROGRAMS ON THE COMBINED PRETESTS AND POSTTESTS

TABLE 2

| Source | Means | df | Mean Square | F |
|---|---|---|---|---|
| Inner-city school | 25.62 | 1 | 259.41 | 2.41 (n.s.) |
| Suburban school | 26.88 | | | |

There was no significant difference between the spelling achievement mean scores of inner-city sixth graders and suburban sixth graders. Consequently, Hypothesis No. 2 was not rejected. The inner-city sixth graders achieved as well as suburban children in the area of spelling.

ANALYSIS OF VARIANCE SUMMARY TABLE COMPARING THE PRETEST AND POSTTEST MEAN SCORES FOR BOTH SCHOOLS ON ALL THREE SPELLING PROGRAMS.

TABLE 3

| Source | Means | df | Mean Square | F |
|---|---|---|---|---|
| Pretest | 23.16 | 2 | 2245.86 | 20.90* |
| Posttest | 29.59 | | | |

*P <.001

As expected, there was a significant difference between the pretest and posttest spelling achievement mean scores within both schools on all three spelling programs. Hence, Hypothesis No. 3 was rejected. Sixth graders from both schools made significant spelling gains over a thirty-two week time period.

## CONCLUSIONS

The results of the present study revealed that sixth graders from an inner-city and a suburban school receiving spelling instruction via the Hanna Linguistic Spelling Program outperformed equivalent groups of sixth graders who received spelling instruction via the Kottmeyer Spelling Program. The Hanna Linguistic Spelling Program was also more effective than the teacher-constructed spelling programs. The Kottmeyer Spelling Program was not more effective than the teacher-constructed spelling program and vice versa.

The significance of these results indicate that a structured, systematic spelling strategy based on linguistic principles may be a superior approach when compared to spelling approaches which emphasize word lists to be memorized by rote.

This study also points out that inner-city sixth graders achieved as well as suburban sixth graders in the area of spelling. The implications of this finding regarding the potential spelling and language proficiency for disadvantaged youth, culturally different youth, linguistically handicapped children and children in ESL programs should be further studied.

The subjects in this study made spelling achievement gains from pretest to posttest as one might expect over an eight month period. However, this finding should not be considered overwhelming since a control group was not feasible. It is difficult and perhaps unjustifiable to convince public school teachers and principals that seventy-two sixth graders be denied spelling instruction for eight months.

Only the seventy-two subjects who received spelling instruction via the Hanna Linguistic Spelling Program achieved significant spelling gains from pretest to posttest when the .01 level of significance was used following the application of correlated *t* tests. However, significant spelling achievement gains were also realized from pretest to posttest, when the entire sample of 216 subjects was subjected to an analysis of variance.

## DISCUSSION

The concern expressed regarding spelling strategies is not new. Concern has been expressed by students, teachers and researchers for the greater part of the twentieth century. It has been estimated that one hundred million spelling textbooks have been produced in the twentieth century.

Great concern has been voiced in attempting to decide upon the most appropriate spelling strategy for a local program. Bremer (1961) states that concern about motivation is often a determining factor in the selection and adoption of a spelling approach. Bremer also listed "teacher enthusiasm" toward spelling as an important variable likely to enhance the learning of spelling by school children.

Another area which contributes to the concerns of both teachers and students is the irregularity and supposed inconsistency of the English language. Its evolutionary and dynamic development coupled with the difficulties inherent in our alphabet do lead to inevitable inconsistencies. Certain inconsistencies may stem from the need to represent, by means of only 26 letters, approximately 50 phonemes. Kenyon and Knott (1953) listed 17 vowel sounds, five diphthongs and 28 consonant sounds. In addition, they identified a number of variations and less common sounds.

Horn (1960) has stated that relatively little change has occurred in the spelling of words included in American dictionaries since the year 1700. Horn asserts that there seems to be little hope that major reforms in spelling will occur, despite numerous and continuous efforts for improvement since the 1800's.

Bloomfield (1941) was instrumental in the development of spelling strategies. Prior to the publication and acceptance of Bloomfield's research work, spelling was largely taught by way of rote memorization of controlled vocabulary word lists or science and social science content words introduced in the context of a paragraph later to be memorized. Bloomfield emphasized that American English employs phoneme-grapheme relationships. Thus, spelling programs should begin by teaching phoneme-grapheme relationships and then guiding pupils to use them in spelling

written words. However, the idea of studying words based on a sound-to-symbol approach was seriously questioned by orthographers who considered the language to be irregular and inconsistent.

A study was conducted by Hanna and Moore (1951) in which they analyzed the alphabetic regularity or irregularity of 3,000 words. These words were mainly root words selected on the basis of frequency of usage counts performed by Gates (1937), Thorndike (1944) and Horn (1966). The results of the Hanna and Moore study indicated that our written code is not so inconsistant that analysis of phoneme-grapheme correspondence cannot provide a basis for spelling instruction. The roots of both the Hanna Spelling Strategy and the Kottmeyer Spelling Strategy stem from the Hanna and Moore study. Both the Hanna and Kottmeyer strategies are based on the philosophy that spelling power is possible only when pupils have learned to look discriminatingly at symbols and words. The key difference between the two strategies is the omission of the weekly word list in the Hanna strategy. Thus, it can be determined whether or not the child has mastered and has applied certain linguistic principles toward accurate spelling rather than testing a child's short-term rote memorization ability.

## RECOMMENDATIONS

First, the present study should be replicated. Second, a control group could be added to the study. Third, a different spelling test could be used. Fourth, a Mexican-American ESL group and a Korean ESL group of students could be added. Fifth, different grade levels should be investigated. Sixth, the attitudes of the students toward the various spelling strategies should be investigated and measured. Seventh, a series of follow up studies or a longitudenal study could be undertaken to see if the measured spelling gains were lasting in effect or merely temporary in nature.

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# APPENDICES

TABLE 4

A COMPARISON OF PRETEST AND POSTTEST MEAN SCORES FOR INNER-CITY SIXTH GRADERS USING THE HANNA SPELLING PROGRAM

| | N | Mean | Variance | Standard Deviation | Standard Error | df | t |
|---|---|---|---|---|---|---|---|
| Pretest | 36 | 22.44 | 99.56 | 9.97 | 1.66 | | |
| | | | | | | 70 | 4.87* |
| Posttest | 36 | 33.92 | 100.02 | 10.00 | 1.67 | | |

* $p < .001$

TABLE 5

A COMPARISON OF PRETEST AND POSTTEST MEAN SCORES FOR INNER-CITY SIXTH GRADERS USING THE KOTTMEYER SPELLING PROGRAM

| | N | Mean | Variance | Standard Deviation | Standard Error | df | t |
|---|---|---|---|---|---|---|---|
| Pretest | 36 | 22.66 | 92.57 | 9.62 | 1.60 | | |
| | | | | | | 70 | 1.45 (n.s.) |
| Posttest | 36 | 26.11 | 109.93 | 10.49 | 1.74 | | |

TABLE 6

A COMPARISON OF PRETEST AND POSTTEST MEAN SCORES FOR INNER-CITY SIXTH GRADERS USING A TEACHER CONSTRUCTED SPELLING PROGRAM

| | N | Mean | Variance | Standard Deviation | Standard Error | df | t |
|---|---|---|---|---|---|---|---|
| Pretest | 36 | 22.86 | 104.80 | 10.23 | 1.70 | | |
| | | | | | | 70 | 1.42 (n.s.) |
| Posttest | 36 | 26.36 | 114.98 | 10.72 | 1.78 | | |

TABLE 7

A COMPARISON OF PRETEST AND POSTTEST MEAN SCORES FOR SUBURBAN SIXTH GRADERS USING THE HANNA SPELLING PROGRAM

| | N | Mean | Variance | Standard Deviation | Standard Error | df | t |
|---|---|---|---|---|---|---|---|
| Pretest | 36 | 23.69 | 97.60 | 9.88 | 1.64 | | |
| | | | | | | 70 | 5.41* |
| Posttest | 36 | 36.14 | 94.00 | 9.69 | 1.61 | | |

* $p < .001$

TABLE 8

A COMPARISON OF PRETEST AND POSTTEST MEAN SCORES FOR SUBURBAN SIXTH GRADERS USING THE KOTTMEYER SPELLING PROGRAM

| | N | Mean | Variance | Standard Deviation | Standard Error | df | t |
|---|---|---|---|---|---|---|---|
| Pretest | 36 | 23.75 | 105.90 | 10.29 | 1.71 | | |
| | | | | | | 70 | 2.21* |
| Posttest | 36 | 29.55 | 142.59 | 11.94 | 1.99 | | |

* $p < .05$

TABLE 9

A COMPARISON OF PRETEST AND POSTTEST MEAN SCORES FOR SUBURBAN SIXTH GRADERS USING A TEACHER CONSTRUCTED SPELLING PROGRAM

| | N | Mean | Variance | Standard Deviation | Standard Error | df | t |
|---|---|---|---|---|---|---|---|
| Pretest | 36 | 23.58 | 95.56 | 9.77 | 1.62 | | |
| | | | | | | 70 | .75 (n.s.) |
| Posttest | 36 | 25.47 | 129.79 | 11.39 | 1.89 | | |

TABLE 10

A COMPARISON OF INNER-CITY AND SUBURBAN SIXTH GRADERS USING THE HANNA SPELLING PROGRAM ON THE POSTTEST SPELLING MEAN SCORES

| | N | Mean | Variance | Standard Deviation | Standard Error | df | t |
|---|---|---|---|---|---|---|---|
| Inner-city | 36 | 33.92 | 100.02 | 10.00 | 1.67 | | |
| | | | | | | 70 | 0.96 (n.s.) |
| Suburban | 36 | 36.13 | 94.01 | 9.70 | 1.62 | | |

TABLE 11

A COMPARISON OF INNER-CITY AND SUBURBAN SIXTH GRADERS USING THE KOTTMEYER SPELLING PROGRAM ON THE POSTTEST SPELLING MEAN SCORES

| | N | Mean | Variance | Standard Deviation | Standard Error | df | t |
|---|---|---|---|---|---|---|---|
| Inner-city | 36 | 26.11 | 109.93 | 10.48 | 1.74 | | |
| | | | | | | 70 | 1.30 (n.s.) |
| Suburban | 36 | 29.56 | 142.59 | 11.94 | 1.99 | | |

TABLE 12

A COMPARISON OF INNER-CITY AND SUBURBAN SIXTH GRADERS USING A TEACHER CONSTRUCTED SPELLING PROGRAM ON THE POSTTEST SPELLING MEAN SCORES

| | N | Mean | Variance | Standard Deviation | Standard Error | df | t |
|---|---|---|---|---|---|---|---|
| Inner-city | 36 | 26.31 | 114.98 | 10.72 | 1.79 | | |
| | | | | | | 70 | 0.34 (n.s.) |
| Suburban | 36 | 25.47 | 129.79 | 11.39 | 1.90 | | |